ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
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Dear Sir:

The first nuclear reactor in Spain is to be supplied by the General Electric Co. (U.S.) in conjunction with the bilaterial nuclear energy agreement between that country and the United States. General Electric's atomic power equipment department will manufacture and supervise installation of a 3,000 KW (heat energy) research reactor in the Moncloa area near Madrid for the Junta de Energia Nuclear. The reactor, of the "swimming pool" type, will use fuel enriched to 20% with uranium-235. Experimental facilities will include six neutron beam ports transmitting radiation from the reactor core into experimental areas; a four by four-foot thermal column transmitting thermal neutrons; and two pneumatic tubes transporting containers of sample materials past the reactor core. (Other PRODUCT NEWS, p. 5.)

Merger of Atomic Instrument Co., producer of nuclear instruments, and Baird Associates, Inc., designers and manufacturers of optical-electronic apparatus, has been agreed upon by the two Cambridge, Mass., firms, subject to approval by stockholders. Dr. Walter S. Baird, president of Baird Associates, will be president of the merged companies, while Leonard W. Cronkhite, president of Atomic Instrument, will be vice-president, marketing. The two firms will be operated by their present staffs as divisions of the new merged organization. It is intended to exchange 2 1/4 Baird shares for 5 shares of Atomic Instrument, based on the March 21st over-the-counter bid prices of 12 1/4 for Baird and 5½ for Atomic Instrument. Baird's gross business for the calendar year 1955 was approximately $2 million, with Atomic Instrument doing about $1 million for that period. (Other FINANCIAL NEWS, p. 3.)

A symposium to help plan Switzerland's policy on industrial use of nuclear energy, is to be held at Neuchatel, April 5, 6 and 7, with French and British scientists participating, and with Robert F. Benenati, of Polytechnic Institute of Brooklyn, the sole U. S. speaker. Mr. Benanati will present a paper on High Temperature Nuclear Reactors at the symposium, being sponsored by the Society of Swiss Engineers and Architects. At Polytechnic Institute, Mr. Benenati is in charge of the nuclear energy program, in the chemical engineering department. A consultant in the nuclear field, he currently is working on the American Turbine Co.'s closed cycle gas turbine nuclear power plant. (Other MEETINGS, CONFERENCES, p. 3.)

Final details of the organization of Atoms for Peace Awards, Inc., were given last week by James R. Killian, Jr., chairman of the new corporation, and president of Massachusetts Institute of Technology. The awards, first disclosed in Geneva last Summer during the International Atomic Energy Conference there, are supported by the Ford Motor Company Fund. The winner of the award each year will receive up to $75,000, and will be selected from individuals or organizations which have made the greatest contributions to the peaceful uses of atomic energy.

Another nuclear device has been detonated in the Soviet Union in the last fortnight, as indicated by monitoring devices in the United States, Canada and Great Britain. In the past eight months, this is the fifth such detonation detected.

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ATOMIC ENERGY BUSINESS NEWS...

RESEARCH REACTOR SOLD ABROAD:- A nuclear research reactor costing approximately $250,000 is to be built by Atomics International division of North American Aviation for the Japanese Atomic Energy Research Institute, near Tokyo. North American's contract calls for completion of the reactor within one year. The reactor, similar in design to one North American has built for Armour Research Foundation in Chicago, uses a water solution of the nuclear fuel. (The Institute is sponsored by the Japanese government and industry of that country. Recently, the Japanese firm of Hitachi established an atomic energy division to conduct research and produce equipment, and will cooperate with Showa Heavy Industry to produce heavy water. Another firm, Shibaura Electric, is also planning a nuclear research laboratory, and will work with Ishikawajima Heavy Industries in industrial atomic energy production.)

NEW GASEOUS DIFFUSION PLANT IN OPERATION:- The new Portsmouth, Ohio plant of the USAEC, producing uranium-235 by the gaseous diffusion proces, is now in full operation. Begun in the Fall of 1952, construction costs were approximately $800 million. The plant, which was built on a high-priority basis, used 20,500 construction workers at its peak. Operating personnel of the plant totals 2,800. One phase of the original construction program still remains to be completed, however. This is a feed plant to convert uranium compounds to uranium hexafluoride. Construction of this facility is expected to be completed within 18-months.

RESERVES BEING ESTABLISHED FOR ATOMIC RISKS:- Coverage greater than previously available for any manufacturing risk will be established for atomic risks, a group of ten U.S. insurance executives, who have been studying the problem, has now advised the USAEC. The group said that stock casualty companies are in the process of developing an insuring facility with a coverage of $50 million for "third party liability" insurance. Mutual companies will be able to handle over $15 million for "third party liability", "physical damage", or both. This will give any one installation over $65 million coverage for "third party liability", which is four times greater than ever before available in the U.S. to any manufacturing operation. For "all physical damage" coverage, the stock fire insurance companies will be able to offer $50 million, which, with the $15 million coverage of the mutual companies, will give $65 million for physical damage also, the group of executives pointed out.

BIDS ASKED, CONTRACTS AWARDED...at atomic energy facilities...

OAK RIDGE, TENN.:- Bids for construction of the development equipment fabrication facility in the X-10 Oak Ridge area have now been asked by the USAEC under invitation no. 401-56-8A. Bid closing date is Apr. 24, 1956; further information from R.J. Dunbar, USAEC, P.O. Box E, Oak Ridge, Tenn.

REACTOR TESTING STATION, IDAHO FALLS, IDAHO:- To supply additional electrical capacity for facilities here, bids (No. AT10-1-818) are now being asked for additions to an existing power substation, and construction of another, involving the furnishing of three 3,750 KVA transformers and auxiliary equipment, and relocating two 2,750 KVA transformers and auxiliary equipment. Further information from: USAEC, P.O. Box 1221, Idaho Falls, Idaho.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...in the nuclear field...

NEW PRODUCTS FROM MANUFACTURERS:- New scintillation detector, model P-20B, uses a flat-face photomultiplier tube designed specifically for scintillation counting. Interchangeable crystals permit the detector's use for alpha, beta and gamma radiation. Three varieties of thallium activated sodium iodide gamma sensitive crystals provide for various background and directional sensitivity characteristics. -- Tracerlab, Inc., 130 High St., Boston, Mass.

NEW APPARATUS UNDER DEVELOPMENT:- A special-purpose computer that gives the geographical fallout pattern of radioactivity resulting from a nuclear explosion has been developed by H.K. Skramstad and J.H. Wright of the National Bureau of Standards, Wash., D.C. Given the necessary weather data, together with certain information about the bomb, this analog computer will assist in predicting what the distribution and intensity of radioactivity will be on the ground after the atomic bomb has been detonated. Problem solution is displayed on a cathode-ray tube, over which a map on a transparent backing can be laid.

ATOMIC ENERGY FINANCIAL NEWS...

CONTROLLING INTEREST IN LARGE CANADIAN URANIUM PROPERTIES SOLD:- Preliminary arrangements have been completed for the merger of the Canadian mining interests (Rio Tinto Canada, Ltd.) of the British Rio Tinto Co., and the interests of J. H. Hirshhorn. Control will be with the British Rio Tinto group which has mining interests in various parts of the world. Rio Tinto Canada, Ltd., to be renamed Rio Tinto Mining Co. of Canada, Ltd., will have an authorized capital of 400,000 "A" shares of $100.00 par value and 40,000,000 common shares of no par value of which 187,000 "A" shares and 23,500,000 common shares will be issued. Interests of Mr. Hirshhorn include Algom, Pronto, Peach, Lake Nordic uranium properties all in the Blind River uranium fields; Anglo-Rouyn and Rix-Athabasca Uranium in northern Saskatchewan; Rexspar Uranium in British Columbia; and Oceanic Iron Ore in New Quebec. The assets of Rio Tinto Mining Co. of Canada. Ltd., will have a value of approximately $50 million. Available cash resources from proposed share and debenture issues will be in excess of $10 million, of which $4 million is being subscribed from English sources. Mr. Hirshhorn will be chairman of the new firm; J.N.V. Duncan of London, president; R.W. Wright of London, managing director; and W.B. Malone of Toronto, vice-president and treasurer.

INSTRUMENT FIRM IN NUCLEAR FIELD REPORTS NEW HIGH IN EARNINGS:- Nuclear Instrument & Chemical Corp., Chicago, manufacturer of instruments for nuclear applications, had net profit of $97,264 for the first six months of its fiscal year ending Feb. 29th, 1956. This was equal to 38¢ a common share and was more than double the $44,003 earned for the same period in 1955. In addition, the firm has built up its cash position to $268,666 from $18,335 a year ago. The reserve will be used to enter new fields in the applications of radioactivity, E. B. Tilton, chairman and president, said, noting that the firm was now in its eleventh year of operation.

DIVERSIFIED NUCLEAR FIRM SHOWS INCREASED NET INCOME IN 1955:- Net income of $437,856 was earned by Vitro Corp. of America in 1955. J. Carlton Ward, president, said this compares with net of $271,758 earned in 1954. Vitro, which is active in all fields of nuclear work, operated all its divisions except its engineering division at a profit in 1955, Mr. Ward said. He noted that this division now has a number of new contracts; early in 1956 it was awarded two projects for reactor facilities, and obtained its first foreign atomic energy project, for the Government of India.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Atoms and the Universe, by G.O. Jones, J. Rotblat, and G.J. Whitlow. The results of research by classical physicists, nuclear physicists, and astrophysicists, both into the structure of matter and of the universe. A worth while volume for both the technically and non-technically trained reader. 254 pages. --Eyre & Spottiswoode, London, Eng. (25s.)

Peaceful Uses of Atomic Energy. Report of the Panel on the Impact of Peaceful Uses of Atomic Energy to the Joint Congressional Committee on Atomic Energy (McKinney Panel) Vol. 1, 155 pages, No. Y4. At 7/2: At 7/13/v.1 (45¢)..... Vol. 2, 749 pages, No. Y4. At 7/2:At 7/13/V.2 ($2.00). --Superintendent of Documents, Wash. 25, D. C.

Atomic Power & The H-Bomb, by C.B.O. Mohr, University of Melbourne, Australia. 20 pages. Cambridge University Press, New York (35¢)

NOTES:- A flowsheet on uranium concentration is offered by Denver Equipment Co., Denver, Colo., manufacturers of mining machinery and flotation apparatus, illustrating a new proved process for uranium concentration (resin in pulp process).

MEETINGS, COURSES, CONFERENCES...

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS:- The A.I.Ch.E. meeting May 6-9, in New Orleans, will have a symposium on liquid metals with 4 papers by General Electric people from Knolls Atomic Power Laboratory and Schenectady discussing heat transfer, and a paper by a representative from Ethyl Corp., New York, discussing manufacture.

OAK RIDGE INSTITUTE OF NUCLEAR STUDIES:- A 4 week advanced medical course will be offered for physicians by ORINS in separate one week units this Spring, Summer, and Fall. Details may be obtained from the Institute at P.O. Box 117, Oak Ridge. The courses will cover Supervoltage & Gamma-Beam Therapy; External Radioisotope Measurement Techniques; Uses of Radioisotopes in Hematology; and General Medical Uses of Radioisotopes.

ATOMIC POWER: Remarks by Dr. Willard F. Libby, Commissioner, USAEC, before the American Power Conference, Mar. 21st, 1956, Chicago, Ill.

By the year 2000 the electrical power consumed per year in the U.S. will have increased by a factor of 20, since electrical power generating capacity in the U.S. is doubling about every 10 years due to population increases, increased use of electrical equipment, etc.

This expansion will strain to the limit coal, oil and gas resources, and since the present known resources of uranium on an equivalent B.T.U. basis are more than 20 times the known resources of oil, coal and gas combined, we therefore conclude that atomic power now is not only desirable but is absolutely necessary. This was the principal conclusion reached at Geneva at the International Conference on Peaceful use of Atomic Energy.

As to when atomic power will become competitive with conventional power, we think it not unreasonable that power from central station plants can be expected to cost not more than 6 to 8 mills/kwh within our lifetime.

Among the technical factors which contribute largely to atomic power costs, there are enormous opportunities for technical advancements in three fields:

In the first, the cost of fissionable material itself, the principal technical opportunity may lie in further development of the breeder reactor which generates more fissionable material at the same time it produces atomic power. Breeder technology is developing rapidly, but it is somewhat too early to foretell what the real chances are of its becoming practical in the next few years.

The second serious need concerns the area of fuel element processing. Most of the cost data now available are based on operating conditions in which the production of plutonium is maximized without regard to the generation of useful power. It is therefore time now for industry to plunge into the development of satisfactory atomic power fuel rods of its own design to maximize the overall benefits of long-time burn-up versus the cost and the chemistry of reprocessing. Some limited experience has been obtained at the Arco chemical processing plant on actual fuel elements from power reactors. It does appear that there are opportunities for designing reactors with the thought specifically in mind of reducing this cost.

The third line of endeavor in which industry should become active concerns the difficulties of maintenance of the reactor and the rest of the plant, particularly such problems as the corrosion of reactor containers and reactor components. Because of the intense radiation in the interior parts of reactors, chemical species are present which are extremely corrosive, and particularly in water systems, peroxides are present.

A fourth line of endeavor for industry is to assist in the problems of training personnel. One of the factors limiting the rate at which atomic power can be developed is the number of competent engineers and scientists available. There are now just too few people working at the task in the U.S.; and the greater the number of gifted people working in the atomic field, the more certain it is that various reactors will be economical and successful. I believe it is incumbent upon industry to set up training schools for their own needs.

I would like now to discuss the bold step which was recently taken by the U.S. that permits industry, both foreign and domestic, to plan sound programs for power reactors. This is the availability of 40,000 kilograms of uranium-235 announced Feb. 22, 1956, by President Eisenhower. This material at the current market price is worth approximately $1 billion. Half is earmarked for domestic power reactors; the other half for foreign reactors. This allocation should be sufficient to fuel an initial electrical generating capacity of several million kilowatts, depending on the types of reactors involved. Manufacturers in the U. S. can now negotiate with foreign countries and purchasers under an authorization issued by the Commission and discuss, on an unclassified basis, reactor designs with specific countries and specific customers. (Classified discussions are permitted with Great Britain, Canada and Belgium.)

It is my belief that Europe and Asia offer challenging opportunities in the initial development of atomic power. The break-even point in competitive atomic power very likely will be attained sooner in Europe and in Asia than in the U.S.; this situation is tailor-made for an industry which still requires some developmental work and "reduction to practice".

ATOMIC ENERGY PATENT DIGEST...

PATENT GRANTS TO PRIVATE CONCERNS AND/OR INDIVIDUALS:- Apparatus for accelerating charged particles within an orbital region. U. S. Pat. No. 2,738,420 issued Mar. 13th, 1956; assigned to General Electric Co., Schenectady, N.Y. (Inventor: James L. Lawson).

Indicating by change in color of a dye when an article has been passed through a field of high energy radiation (during the process of radiation sterilization). U. S. Pat. No. 2,738,429 issued Mar. 13th, 1956, to Samuel A. Goldblith, Melrose, Mass.

Multiple-plate radiation detectors for geological exploration purposes. U.S. Pat. No. 2,738,431 issued Mar. 13th, 1956; assigned to The Texas Co., New York, N.Y. (Inventor: Gerhard Herzog.)

TRADE-MARKS ISSUED TO PRIVATE CONCERNS:- The mark "Q-Gas" is to be issued to Nuclear Instrument & Chemical Corp., Chicago, Ill., under SN-688,066, for self-quenching counter gas for Geiger counters.

PATENT GRANTS TO GOVERNMENTAL ORGANIZATIONS:- Process for dissolving uranium from ores containing ferrous iron minerals and tetravalent uranium. U. S. Pat. No. 2,738,253 issued Mar. 13th, 1956; assigned to Eldorado Mining & Refining, Ltd., Ottawa, Canada, an agency of the Government of Canada. (Inventors: A. Thunaes, E.A. Brown, H.W. Smith, J. Brannen.)

Dosimeter for high energy radiation. U.S. Pat. No. 2,738,430 issued Mar. 13, 1956; assigned to United States of America (Secretary of the Navy). (Inventors: J.H. Schulman, C.C. Klick.)

Meterless radiac survey instrument. U.S. Pat. No. 2,738,432 issued Mar. 13, 1956; assigned to United States of America (Secretary of the Navy). (Inventors: S. Saito, S.R. Gilford.)

Method for producing a quaternary ammonium borohydride. U.S. Pat. No. 2,738,369 issued Mar. 13, 1956; assigned to United States of America (USAEC). (Inventors: M.D. Banus, T.R.P. Gibb, Jr., R. W. Bragdon.)

Liquid monitoring device for determining radioactivity. U. S. Pat. No. 2,738,426 issued Mar. 13, 1956; assigned to United States of America (USAEC). (Inventor: W. M. Hurst.)

Condensable vapor extraction apparatus. U.S. Pat. No. 2,737,779 issued Mar. 13, 1956; assigned to United States of America (USAEC). (Inventor: E.O. Lawrence.)

RAW MATERIALS...prospecting, mining, marketing...

UNITED STATES:- Operation of the U.S. Government-owned uranium processing mill at Monticello, San Juan County, Utah, was taken over April 1st by National Lead Co., 111 Broadway, New York, under a USAEC contract given National Lead. The mill, only one owned by the Government (there are 8 privately owned mills operating in western states, and 4 more being built) had been operated since 1949 by the Galigher Co., of Salt Lake City. National Lead is also contract operator of the USAEC's raw materials development laboratory, at Winchester, Mass., and the USAEC's ore-testing pilot plant at Grand Junction.

A proposal for a $3 million uranium ore processing mill to be constructed in Riverton, Wyo., has been made to the USAEC by Lost Creek Oil & Uranium Co., of Rawlins, Wyo. It is intended to locate the plant adjacent the USAEC's ore-buying station at Riverton.

BELGIAN CONGO:- Approximately 90% of the uranium and thorium ores and concentrates from mines of Union Miniere du Haut-Katanga are now being taken by the Combined Development Agency. This is in accord with the option given the Agency (combined U.S.-British purchasing organization) by the Government of Belgium covering the output of the Union Miniere for 1956 and 1957. Allocations under this purchase option drop to 75% for 1958 and 1960, with new negotiations necessary beyond that period. (In return, the Belgian Government is getting from the U.S. and Britain general and technical nuclear data, special nuclear materials, and equipment for construction of power and research reactors.)

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

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